Claims

[c1] 1. A system for providing improved accuracy of global positioning information, comprising:

at least one sensor to acquire global position measurement information; and

means to improve accuracy of the global position measurement information using noise and error information associated with the global position measurement information.

[c2] 2. The system of claim 1, further comprising multiple sensors to measure overlapping information associated with global positioning, wherein each of the multiple sensors includes different error, noise and accuracy characteristics in performing measurements which are utilized in providing the improved accuracy of the global position measurement information.

[c3] 3. The system of claim 1, wherein means to improve accuracy of the global position measurement information comprises a filter to automatically weigh the global position measurement information based on the noise and error information associated with the global position measurement information.

[c4] 4. The system of claim 1, wherein means to improve accuracy of the global position measurement information comprises an optimal state estimator to provide a weighted state estimate of the global position measurement information using the noise and error information.

[c5] 5. The system of claim 1, wherein the means to improve accuracy of the global position measurement information comprises a global positioning system filter.

[c6] 6. The system of claim 1, wherein the means to improve accuracy of the global position measurement information comprises a Kalman filter.

[c7] 7. The system of claim 1, further comprising:
a sonar sensor to perform an above ground level (AGL) measurement and to provide a standard deviation of the AGL measurement; and
a barometric sensor to perform a mean sea level (MSL) measurement and to provide a standard deviation of the MSL measurement.

[c8] 8. The system of claim 1, further comprising a sensor to measure acceleration, wherein at least a z-axis or altitude acceleration component of the measured acceleration is applicable to the means to improve accuracy of the global position measurement information.

[c9] 9. The system of claim 1, wherein the at least one sensor to acquire global position measurement information comprises a global positioning system module.

[c10] 10. A system for providing improved accuracy of global positioning information, comprising:
at least one sensor to acquire global position measurement information and velocity measurement information; and
means to improve accuracy of the global position measurement information and the velocity measurement information using noise and error information associated with the global position measurement information and the velocity measurement information.

[c11] 11. The system of claim 10, further comprising multiple sensors to measure overlapping information associated with global positioning and velocity, wherein each of the multiple sensors includes different error, noise and accuracy characteristics in performing measurements which are utilized in providing the improved accuracy of the global position measurement and velocity measurement information.

[c12] 12. The system of claim 10, wherein the means to improve accuracy of the global position measurement information and velocity measurement information comprises a filter to automatically weigh the global position measurement information and velocity measurement information based on the noise and error information associated with the global position measurement information and velocity measurement information.

[c13] 13. The system of claim 10, wherein the means to improve accuracy of the global position measurement information and velocity measurement information comprises a Kalman filter.

[c14] 14. The system of claim 10, further comprising:
a sonar sensor to perform an above ground level (AGL) measurement and to provide a standard deviation of the AGL measurement; and
a barometric sensor to perform a mean sea level (MSL) measurement and to provide a standard deviation of the MSL measurement.

[c15] 15. A system for providing improved accuracy of global positioning information to control operation of a vehicle, comprising:
a system for providing global positioning information;
an attitude and heading reference system (AHRS); and
a controller to receive data from the AHRS and the system for providing global positioning information to control operation of the vehicle.

[c16] 16. The system of claim 15, wherein the system for providing global positioning information comprises:
at least one sensor to acquire global position measurement information and velocity measurement information; and
means to improve accuracy of the global position measurement information and the velocity measurement information using noise and error information

associated with measuring the global position measurement information and the velocity measurement information.

[c17] 17. The system of claim 16, further comprising multiple sensors to measure overlapping information associated with global positioning and velocity measurement, wherein each of the multiple sensors includes different error, noise and accuracy characteristics in performing measurements which are utilized in providing the improved accuracy of the global position measurement information and velocity measurement information.

[c18] 18. The system of claim 16, wherein the means to improve accuracy of the global position measurement information and velocity measurement information comprises an optimal state estimator to automatically weigh the global position measurement information and the velocity measurement information based on the noise and error information associated with the global position measurement information.

[c19] 19. The system of claim 16, wherein the means to improve accuracy of the global position measurement information and the velocity measurement information comprises a GPS filter including a Kalman filter.

[c20] 20. The system of claim 16, further comprising:
a sonar sensor to perform an above ground level (AGL) measurement and to provide a standard deviation of the AGL measurement; and
a barometric sensor to perform a mean sea level (MSL) measurement and to provide a standard deviation of the MSL measurement.

[c21] 21. The system of claim 16, wherein the at least one sensor to acquire global position measurement information and velocity measurement information comprises a global positioning system module.

[c22] 22. The system of claim 16, wherein the at least one sensor comprises an inertial measurement unit to measure acceleration, wherein at least a z-axis or vertical component of acceleration is applicable to the means to improve accuracy of the global position measurement information and the velocity measurement information.

[c23] 23. The system of claim 15, further comprising an inertial measurement unit to measure acceleration for use by the system for providing global positioning information and for use by the AHRS.

[c24] 24. An unmanned vehicle, comprising:
a housing member;
at least one sensor to acquire global positioning measurement information contained in the housing member; and
means to improve accuracy of the global position measurement information using noise and error information associated with the global position measurement information.

[c25] 25. The unmanned vehicle of claim 24, further comprising multiple sensors to measure overlapping information associated with global positioning, wherein each of the multiple sensors includes different error, noise and accuracy characteristics in performing measurements which are utilized in providing the improved accuracy of global position measurement information.

[c26] 26. The unmanned vehicle of claim 24, wherein the means to improve accuracy of the global position measurement information comprises a filter to automatically weigh the global position measurement information based on the noise and error information associated with the global position measurement information.

[c27] 27. The system of claim 24, wherein the means to improve accuracy of the

global position measurement information comprises a Kalman filter.

[c28] 28. The unmanned vehicle of claim 24, further comprising:
a sonar sensor to perform an above ground level (AGL) measurement and to provide a standard deviation of the AGL measurement; and
a barometric sensor to perform a mean sea level (MSL) measurement and to provide a standard deviation of the MSL measurement.

[c29] 29. The unmanned vehicle of claim 24, further comprising a sensor to measure acceleration, wherein at least a z-axis or vertical component of an acceleration vector is applicable to the means to improve accuracy of the global position measurement information.

[c30] 30. The unmanned vehicle of claim 24, further comprising:
an AHRS; and
a controller to receive signals from the AHRS and the means to improve accuracy of the global position measurement information to control movement of the unmanned vehicle.

[c31] 31. The unmanned vehicle of claim 30, wherein the controller is adapted to receive to receive other signals, wherein the other signals comprise signals including waypoint information and signals from a remote station.

[c32] 32. A method for providing improved accuracy of global positioning information, comprising:
acquiring global position measurement information; and
improving accuracy of the global position measurement information by using noise and error information associated with acquiring the global position measurement information.

[c33] 33. The method of claim 32, further comprising:

acquiring velocity measurement information; and

improving accuracy of the velocity measurement information by using noise and error information associated with acquiring the velocity measurement information.

[c34] 34. The method of claim 32, further comprising measuring overlapping information associated with global positioning using different sensors, wherein each of the different sensors includes different error, noise and accuracy characteristics in performing measurements which are utilized in providing the improved accuracy of the global position measurement information.

[c35] 35. The method of claim 32, further comprising acquiring AGL and MSL measurement information and associated error and noise information.

[c36] 36. The method of claim 32, further comprising applying the global position measurement information and noise and error information to a filter to provide the improved accuracy of the global position measurement information.

[c37] 37. The method of claim 32, further comprising applying the global position measurement information and noise and error information to a Kalman filter to provide the improved accuracy of the global position measurement information.

[c38] 38. The method of claim 32, further comprising controlling operation of a vehicle in response to the improved accuracy of the global position measurement information.

[c39] 39. A method to control movement of a vehicle, comprising:

acquiring global position measurement information;

improving accuracy of the global position measurement information by using noise and error information associated with the global position measurement information; and

controlling movement of the vehicle in response to the improved accuracy of the global position measurement information.

[c40] 40. The method of claim 39, further comprising:
acquiring velocity measurement information; and
improving accuracy of the velocity measurement information by using noise and error information associated with the velocity measurement information.

[c41] 41. The method of claim 39, further comprising measuring overlapping information associated with global positioning using different sensors, wherein each of the different sensors includes different error, noise and accuracy characteristics in performing measurements which are utilized in improving the accuracy of the global position measurement.

[c42] 42. The method of claim 39, further comprising acquiring AGL and MSL measurement information and associated error and noise information.

[c43] 43. The method of claim 39, further comprising applying the global position measurement information to a filter to improve accuracy of the global position measurement information using the noise and error information.

[c44] 44. The method of claim 39, further comprising applying the global position measurement information to a Kalman filter to provide the improved accuracy of the global position measurement information using the noise and error information.

[c45] 45. A method of making a system for providing higher accuracy global positioning information, comprising:
providing at least one sensor to acquire global position measurement information; and
providing means to improve accuracy of the global position measurement

information using noise and error information associated with the global position measurement information.

[c46] 46. The method of claim 45, further comprising providing multiple sensors to measure overlapping information associated with global positioning, wherein each of the multiple sensors includes different error, noise and accuracy characteristics in performing measurements which are utilized in providing the improved accuracy of the global position measurement information.

[c47] 47. The method of claim 45, wherein means to improve accuracy of the global position measurement information comprises a filter to automatically weigh the global position measurement information based on the noise and error information associated with the global position measurement information.

[c48] 48. The method of claim 45, wherein means to improve accuracy of the global position measurement information comprises a Kalman filter.

[c49] 49. The method of claim 45, further comprising:
providing a sonar sensor to perform an above ground level (AGL) measurement and to provide a standard deviation of the AGL measurement; and
providing a barometric sensor to perform a mean sea level (MSL) measurement and to provide a standard deviation of the MSL measurement.

[c50] 50. A method of making an unmanned vehicle, comprising:
providing a housing member;
attaching at least one sensor to the housing member to acquire global position measurement information; and
providing means to improve accuracy of the global position measurement information using noise and error information associated with the global position measurement information.

[c51] 51. The method of claim 50, further comprising providing multiple sensors to measure overlapping information associated with the global positioning, wherein each of the multiple sensors includes different error, noise and accuracy characteristics in performing measurements which are utilized in providing the more accurate global position measurement information.

[c52] 52. The method of claim 50, further comprising providing means to improve accuracy of the global position measurement information comprises a filter to automatically weigh the global position measurement information based on the noise and error information associated with the global position measurement information.